Super head+R Kit Instruction Manual

Item No. : **01－03－8010**

Applicable models and frame No. (excluding the case of combo kit installation)

Monkey・Gorilla	: Z50J-2000001 ～	XR50R	: AE03-1000001 ～
	: AB27-1000001 ～ 1899999	CRF50F	: AE03-1400001 ～
Monkey BAJA	: Z50J-1700001 ～	XR70R	: DE02-1000001 ～
Monkey R	: AB22-1000017 ～	CRF70F	: DE02-1700001 ～
Monkey RT	: AB22-1007601 ～	CD90	: HA03-1100005 ～

☆ This product is applicable to CD90 engines with the above-mentioned frame No.

・Thank you for purchasing one of our products. Please strictly follow the following instructions in installing and using the products.
・Before fitting the products, please be sure to check the contents of the kit. Should you have any questions about the products, please kindly contact your dealer.

～ Features ～

○ This cylinder head, originally designed by us, is characterized by its unique appearance, completely different from the previous C-type engine. The new head has an enlarged top diameter and a reduced stem diameter of both the intake and exhaust valves, with a new valve angle of nip and port shape. We have incorporated roller bearings into the slipper of a valve rocker arm. The increased weight caused by incorporation of bearings is offset by adoption of an aluminum-forged rocker arm which consequently brings about higher power output at a high rotary area as a result of the synergy effect. With a conventional C-type engine head, it is difficult to replace the cam shaft with the cylinder head being installed. However, with this Kit, the cam shaft can be detached without removing the rocker arm, leaving the bearings on the oil line side of the cam shaft on the cylinder head side. Therefore, this makes it easy to change the cam shafts even when the engine is mounted on the vehicle. Moreover, the new incorporation of the automatic decompression function into the camshaft makes it easy to press down on the kickstarter arm to the end, reducing strain on the kickshaft and gear.

Please read the following carefully before starting installation

◎ Please note that, in some cases, the illustrations and photos may vary from the actual hardware.
◎ We do not take any responsibility for any accident or damage whatsoever arising from the use of the products not in conformity with the instructions in the manual.
◎ This kit is designed for exclusive use in the above-mentioned applicable models of motorcycles and frame numbers, and for exclusive use in motorcycles equipped with a bore-up and bore-stroke exclusively for this kit as well. Therefore, please take note that this kit cannot be mounted on other applicable models of motorcycles, or motorcycles not equipped with bore-up, etc exclusively for this kit.
◎ Installation of this product requires removal and reinstallation of an engine, and disassembly of a clutch. Please prepare HONDA's genuine service manual for the above-mentioned applicable models, and work with enough care following instructions in the service manual. Besides, this instruction manual, as well as HONDA's service manual, is prepared for those who have acquired basic skill and knowledge in tuning. We recommend those who are technically inexperienced or without right tools to ask a technically-trustworthy specialist shop to do the work.
◎ We shall be held free from any kind of warranty whatsoever of products other than this product if the glitch takes place on the other products than this one after the installation and use of this product.
◎ You are kindly requested not to contact us about the combination of our products with other manufacturers'.
◎ A serial number is engraved on the cylinder head. You may be requested to inform us of the number when ordering parts.
◎ Bolts, and nats will be reused. However, be sure to replace worn-down or severely-damaged ones with new ones.
◎ Never use liquid packing. It may plug the oil passage, and in the worst case break the engine.
◎ Be sure to always use premium unleaded petrol. And make sure to check what kind of gasoline is remaining in the fuel tank. Whenever regular gasoline is left in the fuel tank, always replace it with high-octane gasoline.
◎ Determine the heat value of a spark plug depending on how much it is burnt. In vehicles originally with a resistor plug, use a resistor plug.
◎ Never use this kit on the point-ignition system motorcycle.
◎ Please be informed that what we can safely say is that the ignition system of this kit is compatible with ours and stock ignition systems, because no data is available with us on the compatibility with other ignition systems. Therefore, please never use other ignition systems, which may cause technical troubles.
◎ As the stock clutch cannot be used, a centrifugal filter gets unavailable. Therefore, install an oil filter outside.
◎ Please install an oil cooler when necessary.
◎ Engine oil must be API SF or higher class, such as SAE 10W-40 / 15W-50, which are our recommendations.
◎ Change the sprocket with the one which meets the output and specifications.
◎ This kit cannot be used alone if you have purchased a cylinder head kit. If you have not purchased "our special engine parts", please purchase special parts with reference to the attached "Reference data on kit."
◎ This kit is compatible with only those engine parts recommended by us. So, please replace the engine parts not recommended by us with those of our recommendations.
◎ Since this kit is designed and developed for driving in closed races, do not use the kit for running on public roads.
◎ In case you have purchased this product as a combo kit, the above-mentioned applicable models vary depending on the type of drive sprocket.
◎ When the 124cc Kit is to be used together with a standard crankcase, the crankcase needs to be processed in the section where a sleeve is to be attached. As we accept the processing, send the crankcase to us after carefully reading the instruction manual for your Cylinder Kit. Or, contact your local specialist shop handling internal combustion products.
◎ We not recommend using stock crankcase with this kit. Because of stock crankcase will not hold the power of this kit.
Use Special crankcase Kit (100 / 106cc : 01-00-0038, 124cc : 01-00-0039, 138cc : 01-00-0040)

Important notice

Idling, sudden acceleration, and sudden engine braking will put a heavy load on the engine, which please note may result in crank shaft damage and engine breakage in the worst case.

⚠Caution The following show the envisioned possibility of injuries to human bodies or property damages as a result of disregarding the following cautions.

・Since this kit is designed and developed for driving in closed races, do not use the kit for running on public roads.
・Work only when the engine and muffler are cool at below 35 degrees Celsius. Otherwise, you will burn yourself.
・Prepare right tools for the work. (Otherwise, improper work could cause breakage of parts or injuries to yourself.
・As some products and frames have sharp edges or protruding portions, please work with utmost care. (Otherwise, you will suffer injuries.)
・Always use new gasket and packing. (The worn or damaged parts may cause the engine troubles.)

Dec./15/ '10 rev.Mar./25/ '11 rev.Apr./13/ '11

⚠Warning The following show the envisioned possibility of human death or serious injuries to human bodies as a result of disregarding the following cautions.

- Those who are technically unskilled or inexperienced are required not to do the work. (Improper installation because of insufficient skill and knowledge could lead to parts breakage and subsequently to accidents.)
- Before doing work, secure the motorcycle on level ground for safety's sake. (Otherwise, your motorcycle could overturn and injure you while you are working.)
- Always start the engine in a well-ventilated place, and do not turn the engine on in an airtight place. (Otherwise, you will suffer from carbon monoxide poisoning.)
- As gasoline is highly flammable, never place it close to fire. Make sure that nothing flammable is near the gasoline. (It may cause a fire.)
- Always use a torque wrench to screw bolts and nuts tight and securely to the specified torque. (Improper torque could cause these parts to get damaged or fall off.)
- Never use the parts unspecified by us. (This may lead to parts breakage and consequent accidents.)
- If you find damaged parts when checking and performing maintenance, do not use these parts any longer, and replace them with new ones. (The continued use of these damaged parts as they are could lead to accidents.)
- When you notice something abnormal with your motorcycle while riding down a road, stop riding immediately and park your motorcyle in a safe place. (Otherwise, the abnormaility could lead to an accident.)
- Before riding, always check every section for slack in parts like screws. If you find slack ones, screw them securely up to the specified torque. (Or improper torque may cause parts to come off.)
- Check or perform maintenance of parts correctly according to the procedures in the instruction manual or a service manual. (Improper checking or maintenance could lead to an accident.)
- Always use high-octane gasoline. (Otherwise, troubles such as engine knocking may cause accidents.)

◎ Please be informed that, mainly because of improvement in performance, design changes, and cost increase, the product specifications and prices are subject to change without prior notice.
◎ This manual should be retained for future reference.

●Cautions before riding:

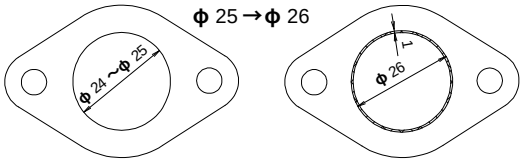
① About fuel:
Whenever regular gasoline is remaining in the fuel tank, always replace it with high-octane gasoline.
②With this kit installation, a centrifugal filter will be lost. So, please install a dry-type clutch with an external oil filter or a special clutch.
③ About change of a sprocket:
◇The installation of this kit will increase the power of your vehicle. So the use of a stock sprocket will result in severe wears of parts because of too low gear, not only adversely affecting the engine life, but also breaking the engine in the worst case. Therefore, please change the sprockets with the high-geared one.

This kit cannot function on its own. Referring to the attached sheet, please purchase a kit for exclusive use with this kit. This does not apply if you have purchaed a full kit.)

● Others:

Oil cooler:
◇ The installaiton of this kit increases the heat release value of the engine, set off by the increase in power. For a long-time and high load running, we recommend you to install an oil cooler kit which keeps oil at appropriate temperatures and prevents such troubles as oil film shortage at high temperatures.

Carburetor manifold:
◇ The surface of a manifold, compatible with R-Stage & old Super Head, with a port diameter of φ24～φ25 on the side of an inlet pipe, will not be level with the cylinder head because of the difference in manifold diameter. Enlarging the manifold's port diameter on the manifold side will bring about smoother output characteristics.



◇ We advise you to use a special carburetor kit for Super Head+R.
For the part numbers of the carburetor kits, please refer to the parts list of our recommendations on page 3.
- Special manifold only for Super Head+R
  VM26: 003-02-2541
  PE28 : 003-02-2551

● About camshaft:

◇If you have purchased a cylinder head kit, a special camshaft is needed separately. Camshafts with a few kinds of profiles are available from us to meet different uses and engine displacement. Even if you have purchased a full kit, you can study to use them as an optional extra in addition to camshafts inclued in the full kit. For more information, please refer to enclosed paper.

● An inspection cap and a breather cap are included in this kit. In case you use a breather cap, please use an oil catch tank at the same time.

●Revolution

◇Upper limt of revolutions varies depending on the installed cam shafts, etc. Referring to the camshaft comparison graph on page A'3, install a revolution counter to make sure that you drive the engine at revolutions below the upper limit.
◇Take note that idling and sudden acceleration in the 1st and the 2nd gears particularly tend to exceed the upper limit of revultions. Over revolutions will result in nonsmooth revolutions of the engine, not only adversely affecting the engine life, but also breaking the engine in the worst case.

●Titanium valve spring retainer (optional)

◇ This Super Head has optional titanium valve spring retainers.
Titanium retainers are about 30% lighter than steel retainers.
The surface is treated with a special coating of which hardness is HV1000 above for added shock-resistance and wear-resistance.
Item No.01-12-084 (2 pcs)

● A serial number is punched on the cylinder head just for the sake of administration. You may be requested to inform us of the number when ordering repair parts.
In case you are not able to order parts because you do not have the repair parts numbers or for other reasons, please place an order in the following way.
☆ Make a note of the number punched on the left side of the cylinder head.

Example of how to order→ Super head kit, repair
head No.-2SM-00001→ Intake valve
Qty: 1 piece

● For those who have purchased a cylinder head alone, selection sets are available to meet your combination demand for engine displacement, etc. Please study the required contents of the kit, referring to "Reference data on kit" on enclosed paper.
Please contact your dealer for more details about the kit or enquiries.

Dec./15/ '10 rev.Mar./25/ '11 rev.Apr./13/ '11

● Engine parts of our recommendations:

※This kit is only compatible with those engine parts recommended by us. So, please replace the parts not of our recommendations with those of our recommendations.

Parts of our recommendations			
Clutch	Special clutch kit		
	Dry-type clutch kit		
Ignition system	Stock C.D.I.		
	Hyper C.D.I.		07-02-15
	C.D.I. Magnet		05-02-0511
Carburetor	MONKEY 88cc 106cc 124cc	Mikuni VM26 carburetor kit	03-05-0484
		Keihin PE28 carburetor kit	03-05-0981
	138cc	Mikuni VM26 carburetor kit	03-05-0482
		Keihin PE28 carburetor kit	03-05-098
	MONKEY-R 88cc 106cc 124cc	Mikuni VM26 carburetor kit	03-05-0484
		Keihin PE28 carburetor kit	03-05-095
	CRF50	Mikuni VM26 carburetor kit	03-05-3245
Oil pump	Super oil pump kit		01-16-0051
Cam chain (Only in case of a cylinder head kit)	High-duty cam chain kit	88cc 106cc	01-14-0002
		124cc	01-14-0003
		138cc	01-14-0006
Oil catch tank (Only for the Monkey/Gorilla)	Oil catch return tank kit		07-05-0010
(Only in case a head breather cap is used.)	Oil catch tank kit		09-04-032

☆ It's impossible to install this product to a CD90 motorcyle because there is no compatible carburetor. Please take note that this product is applicable to engines with the above mentioned CD90 frame No. only.

● About optional camshafts

○The following camshafts compatible with this Kit are available from us. Referring to the below-mentioned output graphics, please select a camshaft to match your usage and engine displacement for your great riding pleasure.

S-12D camshaft	01-08-0101	option
S-1D5 camshaft	01-08-0102	Packed together with Monkey / Gorilla (88/106) Packed together with CD90
S-20D camshaft	01-08-0103	Packed together with Monkey / Gorilla Bore Stroke Up (124)
S-25D camshaft	01-08-0104	Packed together with Monkey / Gorilla Bore Stroke Up (138)
S-30D camshaft	01-08-0105	option
S-35D camshaft	01-08-0106	option

○ About Camshafts Number

The bigger the numbers of XX / YY are, the wider the durations are. With these camshafts, the output power will produce more to high rpm range. While, the smaller the numbers are, the narrower the durations are. With these camshafts, the output power will produce more to low-to-mid rpm range. We supply the suitable camshaft depending on the displacements.

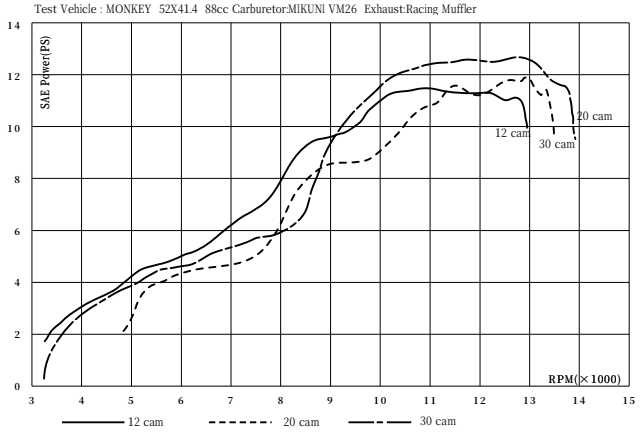
When choosing the optional camshafts, please choose the camshaft referring to the camshaft data chart to suit your riding purpose.

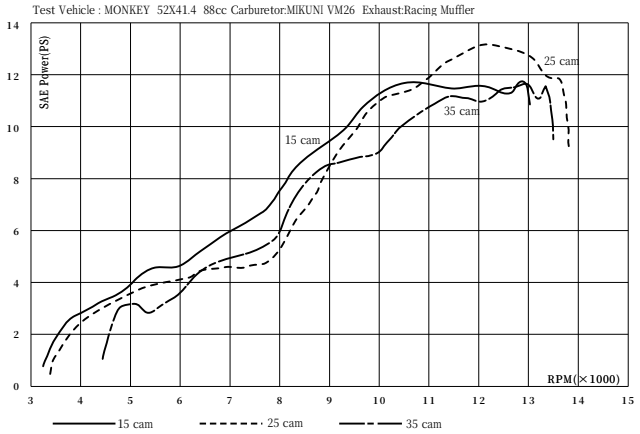
Also, the engine output will vary significantly depending on the using exhaust system, length of inlet pipe, carburetor diameter, compression ratio, ignition system, ignition timing, fuel or natural phenomenons such as ambient temperature or atmospheric pressure.

☆ Camshaft comparison data list

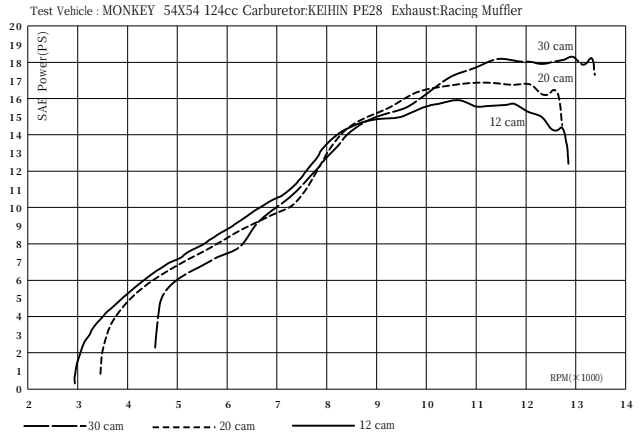
Note: As these are the data measured on a Dyno Jet, the data differ from the actual driving. Please refer to them just for a reference. The engine power varies significantly depending on the temperatures.

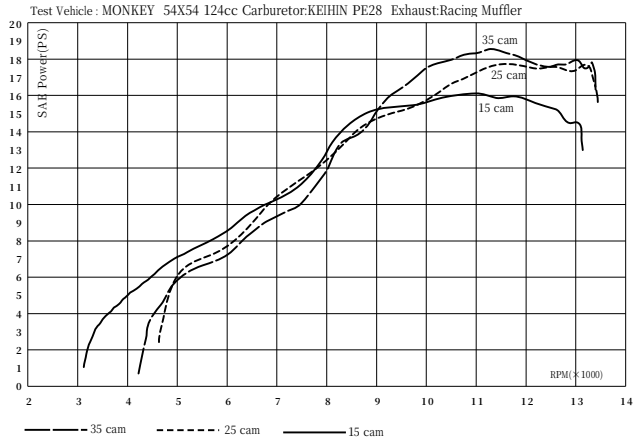
● 88 cc



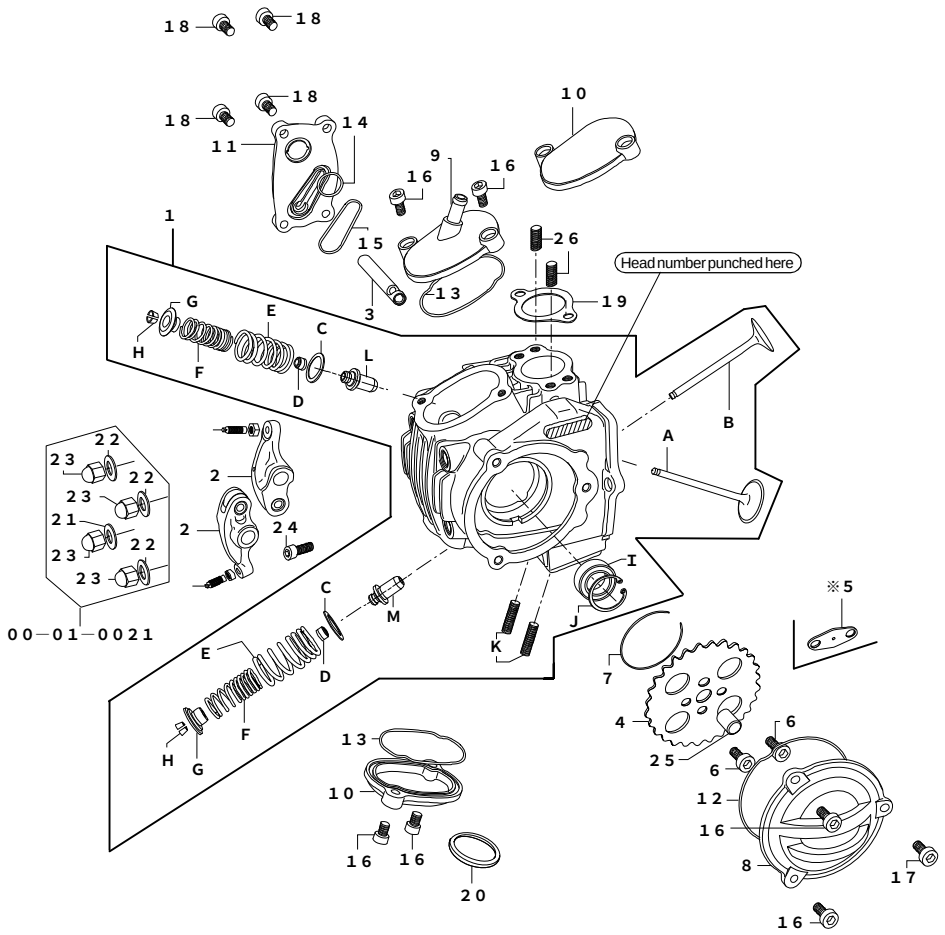


● 124 cc

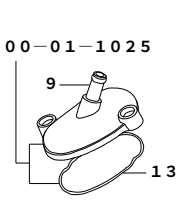


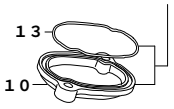


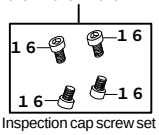
～Kit Contents～

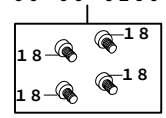


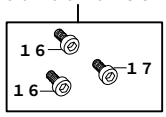
∴ Please note that in ordering repair parts, be sure to quote the Repair Part Item No. Otherwise, we may not be able to accept your orders.
There are some parts, however, for which we are not in a position to accept your order in just the quantity to be used. In this case, please take them in the quantity packed.

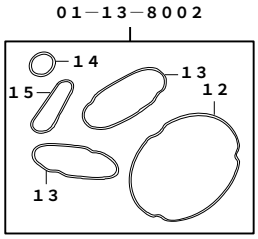


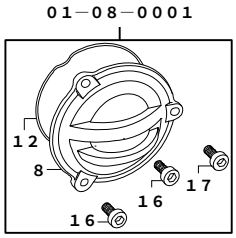












No.	Parts Name	Qty	Repair parts No.	Qty
1	Cylinder head COMP.	1	06120-2SM-T00	1
2	Rocker arm COMP.	2	14431-SPH-T01	1
3	Rocker arm shaft	1	14451-SPR-T00	1
4	Cam sprocket	1	00-01-0099	1
※5	Cam gear washer	1	00-01-0022 (with a bolt)	1
6	Cap screw, 5x12	2	00-00-0066	4
7	Cam shaft circlip	1	00-01-0081	3
8	Left side-cover	1	01-08-0001	1
9	Breather cap	1	————	
10	Inspection cap	2	————	
11	Right side-cover	1	11121-SPH-T01	1
12	Left side-cover O-ring	1	01-13-8002	3
13	Inspection cap O-ring	2		3
14	O-ring, 15 mm	1		6
15	Right side-cover O-ring	1		3

No.	Parts Name	Qty	Repair parts No.	Qty
16	Cap screw, 5x15 (SUS)	6	00-00-0041	4
17	Cap screw, 5x10 (SUS)	1	00-00-0233	3
18	Cap screw, 5x12 (SUS)	4	00-00-0160	4
19	Manifold gasket	1	00-03-0009	3
20	Exhaust pipe gasket	1	00-01-0064	2
21	Copper sealing washer	1	00-01-0029	4
22	Sealing washer	3	00-00-0344	4
23	Cap nut, 6 mm	4	————	
24	Cap screw, 6x18	1	00-00-0156	4
25	Dowel pin, 8x12	1	00-00-0153	2
26	Socket set screw, 6x15	2	00-00-0162	2
	Alumi Special (5 g)	1	00-01-0001	1
Tool	Hex wrench, 3 mm	1	————	
Tool	Hex wrench, 4 mm	1	————	
Tool	Hex wrench, 5 mm	1	————	

Symbol	Parts Name	Qty	Repair parts No.	Qty
A	Intake valve	1	14711-SPH-T01-F	1
B	Exhaust valve	1	14721-SPH-T01-F	1
C	Valve spring outer seat	2	00-01-0002	2
D	Valve stem seal	2	00-01-0015	2
E	Valve spring (outer)	2	01-12-0101	2
F	Valve spring (inner)	2		2
G	Valve spring retainer	2	00-01-0078	2

Symbol	Parts Name	Qty	Repair parts No.	Qty
H	Valve cotter	4	00-01-0018	4
I	Radial ball bearing	2	00-01-0084	1
J	C-shaped ring	1		1
K	Stud bolt, 6x32	2	00-01-0085	2
L	Over-sized valve guide, IN	1	00-00-0165	1
M	Over-sized valve guide, OUT	1	00-01-0332	1

Item No. marked with an ※ is not used when an automatic decompression camshaft is to be installed.

SPECIAL PARTS TAKEGAWA Co.,Ltd.
3-5-16 Nishikiorihigashi Tondabayashi Osaka Japan TEL : 81-721-25-1357 FAX : 81-721-24-5059 URL : http://www.takegawa.co.jp

～Cylinder Head Installation Procedures～

○Removethe rocker arm shaft and adjusting bolts and nuts on the original cylinder head.

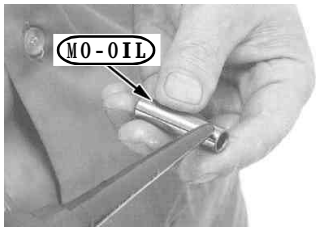
○If you find the removed adjust bolt & / or adjust nut damaged, replace it / them with (a) new one(s).

○ Apply engine oil to the removed adjusting bolts, and fixthese bolts to rocker arms of the kit.

○ Fix the rocker arms to the Super Head.

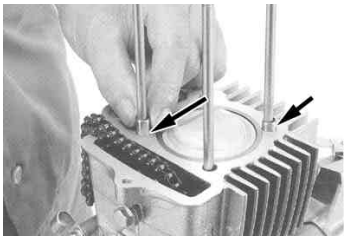
Apply molybdenum solution to the original rocker arm shaft, and fix it on the exhaust side.

Apply molybdenum solution to a rocker arm shaft of the kit as well, and fix it with its slit part pointing to the cam chain side.



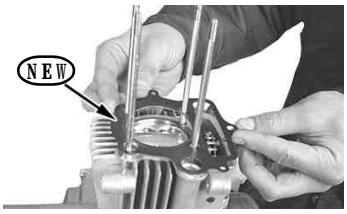
Included part for intake side

○Fix 8x14 dowel pins of the kit into the dowel pin holes on the cylinder.



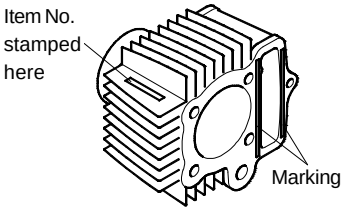
○ Thoroughly degrease the upper surface of the cylinder.

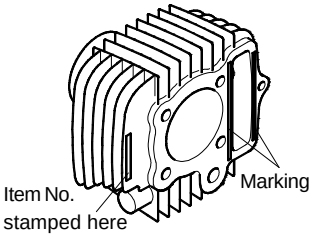
○For V, H, S (SCUT) cylinder: use 0.25mm head gasket.



∴ Please use appropriate gasket.

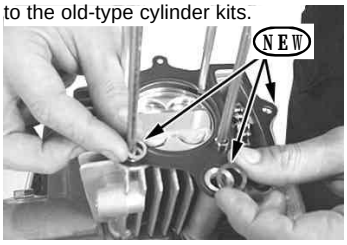
Note: These cylinders have a marking on the cylinder head surface or its Item No. is stamped on the fin side.





○ No parts number stamped on your cylinder, (or cylinder uses green O-ring) please use 1.0mm(3 pcs metal) head gasket with green O-ring and black rubber gasket.

The above applies only to the old-type cylinder kits.

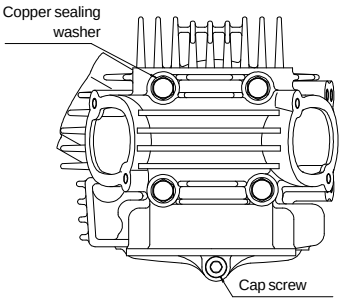


∴ Please use appropriate gasket.

○ Set the piston at the top dead center position, and install the cylinder head.

○Fix the cam chain so it will not fall into the crankcase.

○ After applying Alumi Special a little to the threaded part of the cylinder head stud bolts, fix a copper washer of the kit to the lower-left part (oil line) and washers of the kit to other parts. Then fix four cap nuts of the kit and 6x18 cap screws as indicated in the figure below, and loosely tighten them.



○ Tighten nuts on the stud bolt diagonally to the specified torque in a few steps.

⚠CAUTION : Be sure to tighten to the specified torque.
T : 12N • m (1.2kgf • m)

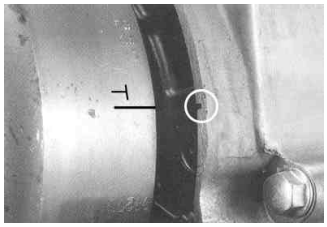
○Tighten the side bolt on the cylinder side and the cap screws on the cylinder head side to the specified torque.

⚠CAUTION : Be sure to tighten to the specified torque.
T : 12N • m (1.2kgf • m)

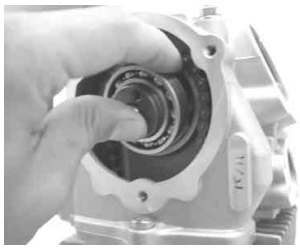
○ Tighten a cam chain guide roller of the cylinder to the specified torque.

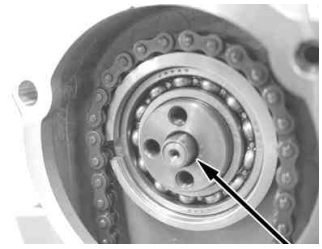
⚠CAUTION : Be sure to tighten to the specified torque.
T : 10N • m (1.0kgf • m)

○ Align a “T” mark on the flywheel with an alignment mark on the crankcase. Then set the piston at TDC (Top Dead Center).



○ Apply engine oil to a bearing on the camshaft COMP., which please fit to a cylinder head. And put a provided 8x12 dowel pin into the center hole in the camshaft.



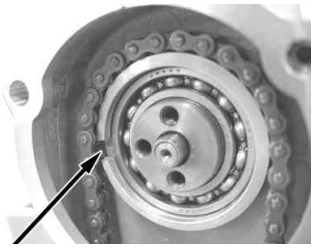


Dowel pin 8 x 12

NOTE : The supplied dowel pin will not be used in case a dowel pin is pressed into your camshaft.

Dec./15/ '10 rev.Feb./21/ '11

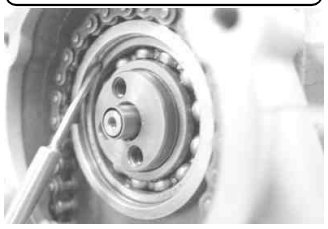
○ Fix a cam shaft circlip of the kit, and fix the cam shaft.
At this stage, set the location of ring end gap of the circlip not to meet the notch on the cylinder head cam hole.



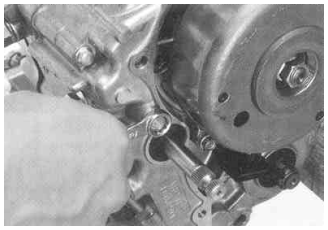
Notch

○Check that the circlip is right in the circlip groove.

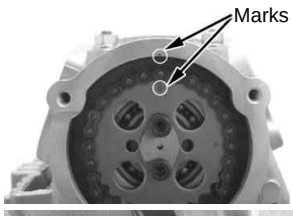
⚠Warning : Do the checking without fail.

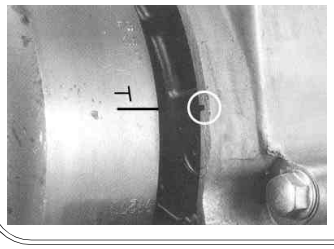


○Remove the side bolt on the cam chain tensioner.



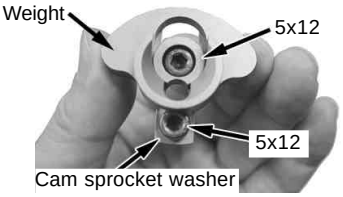
○ Attach the cam chain to the cam sprocket, and fix them with a cam sprocket plate and two 5x12 (black) cap screws included in the kit.
(At this point, apply Alumi Special a little to the threaded parts of the cap screws.)
Then align the "T" mark on the flywheel with the alignment mark on the crankcase, and align an "O" mark on the cam sprocket with the alignment mark on the cylinder head.



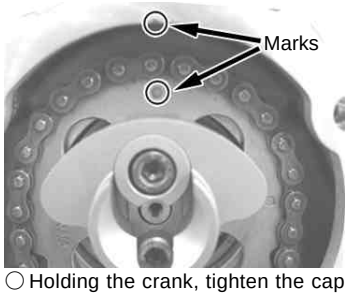


●In case you install an automatic decompression cam shaft:

○Set a cam sprocket washer through a weight, and set two black 5x12 cap screws into upper and lower holes.



○ Attach the camchain to the cam sprocket. And place the weight to face the "O" mark and install it with two black 5x12 cap screws.
(At this time, apply a thin coat of Alumi Special, the heat-resistant lubricating agent, to the thread of the cap screw.) Then, align the "T" mark on the flywheel with the alignment mark on the crankcase, aligning the "O" mark on the cam sprocket with the alignment mark on the cylinder head.

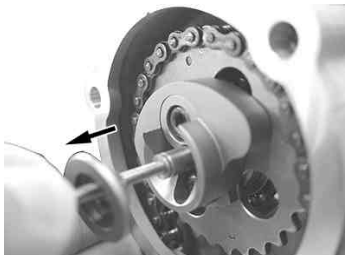


○ Holding the crank, tighten the cap screws, which are attached to fix the cam sprocket, to the specified torque.

⚠CAUTION : Be sure to tighten to the specified torque.
T : 10N • m (1.0kgf • m)

○Check that the "T" mark on the flywheel is still aligned with the "O" mark on the cam sprocket.

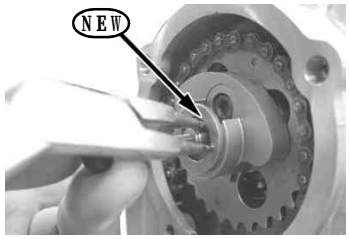
○ Pass a 6mm snap ring and a plate into a thumb screw supplied in the Camshaft Kit, attach it to the shaft tip of the camshaft comp. and pull the shaft toward you.



○ Attach a snap ring in the shaft groove.

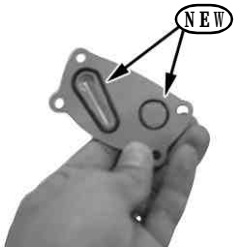
⚠CAUTION : Do not expant the snap ring more than necessary.

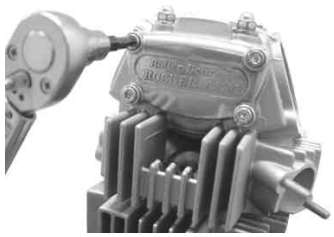
⚠WARNING : Always use a new snap ring at any time, and do not reuse it.



○ Apply engine oil a little to two kinds of O-rings for the right side cover, and fix them to the right side cover. Then tighten them with 5x12 cap screws of the kit to the specified torque.

⚠CAUTION : Be sure to tighten to the specified torque.
T : 6N • m (0.6kgf • m)



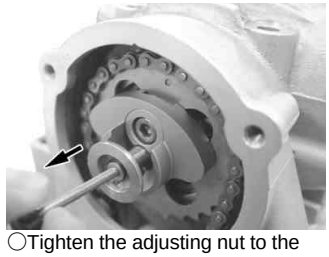


○Check that the "T" mark on the flywheel is aligning with an alignment mark on the crankcase.

○ Adjust the valve clearance with an adjust screw.
IN : 0.05 ～ 0.08 (when cold)
OUT : 0.05 ～ 0.08 (when cold)

●When installing an automatic decompression cam shaft:

○Adjust the valve clearance on the EX side with the shaft of the camshaft being pulled toward you so that the decompression function can be deactivated.



○Tighten the adjusting nut to the specified torque.

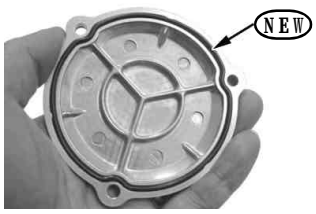
⚠CAUTION : Be sure to tighten to the specified torque.
T : 10N • m (1.0kgf • m)

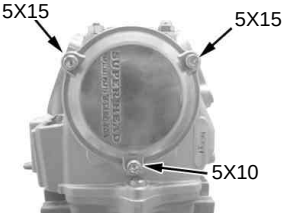
○ Unfasten the thumb screw.

○Apply engine oil a little to a left-side-cover O-ring of the kit, and fix it to the left side cover. Then fix them to the cylinder head with two 5x15 cap screws and with a 5x10 cap screw of the kit and tighten them to the specified torque. (Be careful of the location of screws.)

⚠CAUTION : Screws must be used at the specified positions only.

⚠CAUTION : Be sure to tighten to the specified torque.
T : 6N • m (0.6kgf • m)



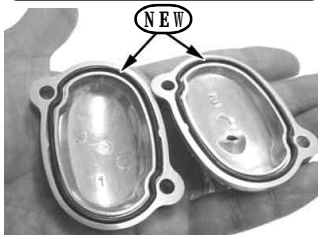


○After applying engine oil a little to an O-ring on the inspection cap of the kit, attach the O-ring to the inspection cap, and fix the inspection cap with 5x15 cap screw of the kit, and tighten up the screw to the specified torque.

● In case a breather cap is used:

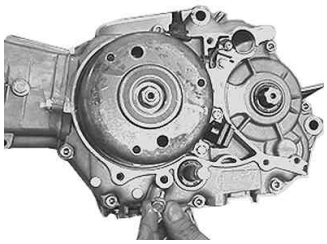
○Apply engine oil a little to insection cap O-rings of the kit, and fix them to the breather cap and the inspection cap. Then fix and tighten the breather cap on the intake side and the inspection cap on the exhaust side with 5x15 cap screws of the kit to the specified torque.

⚠CAUTION : Be sure to tighten to the specified torque.
T : 6N • m (0.6kgf • m)



○Pour engine oil from the side bolt hole in the cam chain tensioner, and tighten the side bolt.

⚠CAUTION : Be sure to tighten to the specified torque.
T : 8N • m (0.8kgf • m)

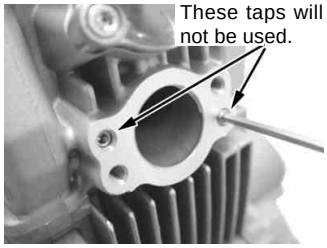


○ With reference to the service manual, mount the engine on the frame.

⚠CAUTION : Be sure to follow the instructions in the manual.

○ Install socket set screws of the kit to two taps on the cylinder head ports which will not be used for manifold installation, and tighten them to the specified torque.

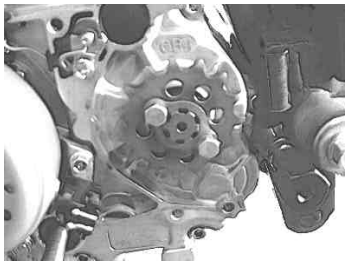
⚠CAUTION : Be sure to tighten to the specified torque.
T : 5N • m (0.5kgf • m)



○Following the instruction manual for the relative carburetor, install the carburetor.

○ Install the drive sprocket.

⚠CAUTION : Be sure to tighten to the specified torque.
T : 12N • m (1.2kgf • m)



○ Install the generator cover.

⚠CAUTION : Be sure to tighten to the specified torque.
T : 7～11N • m (0.7～1.1kgf • m)

○ Add engine oil in amount specified by the clutch kit you use.

○ With reference to the service manual, attach the drive chain.

☆ In the case of a three-point support crank shaft (3B) kit, fix a generator cover according to crank-kit installation instructions.

○ In case you use a breather cap, fix a breather hose according to oil-catch-tank installation instructions.

∴ In case you use a breather cap, fix a breather hose according to oil-catch-tank installation instructions.

• Item No. for a blade hose set (1 m, with clips) : 000-03-054

☆ Engine Starting ☆

○ Check that the ignition key and the fuel cock are turned OFF.

○Continue kicking the starter for a while to circulate the engine oil all around the engine.

○Install the spark plug. Apply Alumi Special a little to the threaded part of the plug, and fix it.

⚠CAUTION : Be sure to tighten to the specified torque.

Designated plug

NGK : CR8HSA
Thermal value

DENSO : U24FSR－U
Thermal value

○Attach the plug cap to the spark plug.

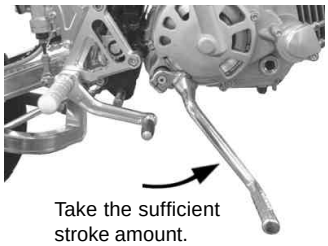
○ Wipe off the dirt and dust on the engine.

○ Turn ON the fuel cock and ignition key, and start the engine.

⚠WARNING: Work only in a well-ventilated place.

●When installing an automatic decompression cam shaft:

※ When starting the engine, keep the stroke of the kickstarter arm wide enough.
Usually, the stroke amount of the kickstarter arm becomes short especially when a dry-type clutch is installed onto the engine, which makes it hard to start the engine. Adjust the angle at which to install the kickstarter arm, and start the engine, taking sufficient stroke amount.



Take the sufficient stroke amount.

○ Check for any abnormality such as an abnormal sound.

○ If nothing abnormal is detected, carry out a shakedown for about 30 to 50 km, and check the valve clearance again.

⚠CAUTION: Work only when the engine and the muffler are cool.

○ Carry out a shakedown again for about 100 to 150 km.

○ After the shakedown, double-check for any abnormality such as an abnormal sound and blow-by gas.
(If any abnormality is detected, disassemble the engine again and check each section.)

⚠WARNING: Never re-use parts which cannot be re-used.

INSPECTION / SERVICE LIMITS

⚠ WARNING

Since this cylinder head manual is prepared for those who have acquired basic skills and knowledge in tuning, those who are technically unskilled or inexperienced are required not to do the work.

●After the disassembly of the hardware and a cylinder head, clean them before the inspection and measuring. And then, blow them with compressed air, and dry them well.
●Engine oil for lubricating the camshaft will be supplied through the oil passage in the cylinder head. Clean the oil passage before assembling the cylinder head.
●After the disassembly of hardware, put a mark on the hardware so they can be reinstalled correctly to their original position.

Reference Value List for Cylinder Head Maintenance

Items	Standard	Service Limit	Remarks
Valve clearance (intake)	0.05～0.08mm (when cold)	————	
(exhaust)	0.05～0.08mm (when cold)	————	
Cylinder head distortion	————	0.05mm	Modify or replace
Inside diameter of valve rocker arm	————	10.05mm	Replace
Outside diameter of rocker arm shaft (intake / exhaust)	————	9.92mm	Replace
Clearance between a rocker arm and a shaft	0.013～0.037mm	0.10mm	Replace
Inside diameter of valve guide (intake)	————	4.56mm	Replace the guide or the head
(exhaust)	————	4.57mm	Replace the guide or the head
Outside diameter of valve stem (intake)	————	4.47mm	Replace
(exhaust)	————	4.45mm	Replace
Clearance between a valve stem and a guide (intake)	0.01～0.037mm	0.09mm	Replace the guide or the head
(exhaust)	0.025～0.052mm	0.12mm	Replace the guide or the head
Valve seat contact width (Intake)	0.8～1.0mm	1.5mm	Modify or replace the head
(exhaust)	1.0～1.2mm	1.7mm	Modify or replace the head
Free length of valve spring (outer)	————	33mm	Replace
(inner)	————	28.5mm	Replace

○Special tool : Valve spring compressor set of Item No. 00-01-1005

○Torque unit

1 kgf • m = 9.80665 N • m (=newton meter)

MO-OIL ○This mark shows molybdenum solution.

This solution is a mixture of molybdenum grease and engine oil (in the ratio of 1:1).

∴Apply molybdenum solution or assembly paste to the portions where it is indicated that molybdenum solution needs to be applied.

NEW ○This mark shows those parts to be replaced with every overhaul.

Do not fail to replace these parts every time they are overhauled.

AL-SPL ○This mark means Alumi Special (heat-resistant lubricating agent).

•Alumi Special = heat-resistant lubricating paste and grease which prevent galling from high temperatures and heavy loading, and adhesion.

(Purpose: good for those parts which get hot like a spark plug and exhaust manifold.)

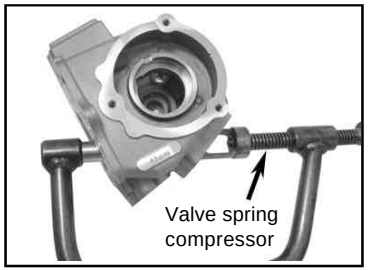
☆Never apply this to any parts other than the specified parts.

●Splitting of Valve

・Compress the valve spring, using a valve spring compressor.

⚠ CAUTION: Never compress it more than necessary.

∴Special tool: Valve spring compressor set of item No. 00-01-1005



・Removal of Valve Cotter

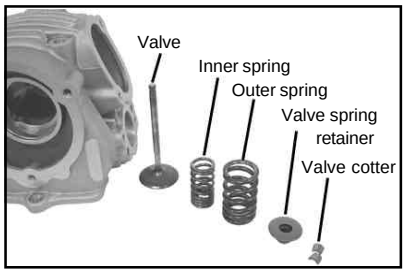
Use a magnet to remove the cotter if it does not come off easily.

・Remove first the valve spring compressor, and then the following parts:

・Valve spring retainer

・Valve spring (Inner & Outer)

・Valve



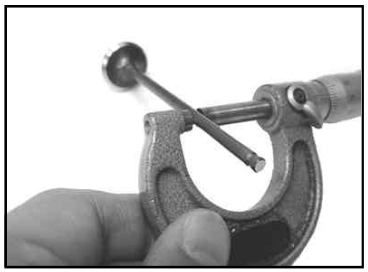
⚠ CAUTION: If the valve is damaged at its end, do not remove it forcibly, but rectify the end first before removing it.

Check each valve for bending, baking, and damages.

・Measure the exterior diameter of the valve stem at the sliding surface of the guide with a micrometer.

Service Limit IN : 4.47 mm
EX: 4.45 mm

Replace the bent, baked or damaged valves with new ones.

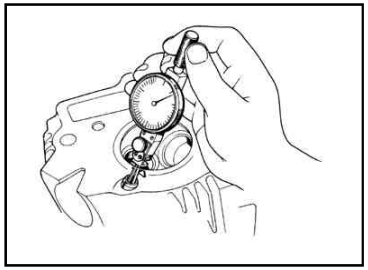


Inspection of the Valve Guide.

・Measure the inner diameter of the valve guide.

Service Limit IN : 4.56 mm
EX: 4.57 mm

Replace the valve guide or cylinder head if the valve guide is scratched or damaged.



Outer diameter of the valve stem subtracted from the inner diameter of valve guide is a guide clearance.

Service Limit IN : 0.09 mm
EX: 0.12 mm

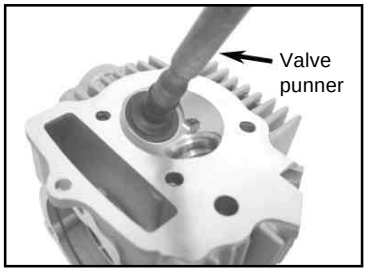
Inspection of Valve Seat

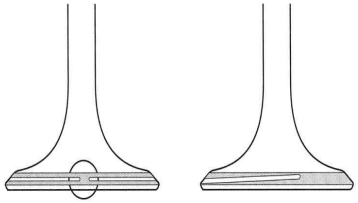
・Remove carbon sediment in the cylinder head combustion chamber and valve.

・Dissolve red lead primer with oil or the like, and apply it to the valve face evenly.

・Strike the valve once and lightly with a valve punner, and rotate it.

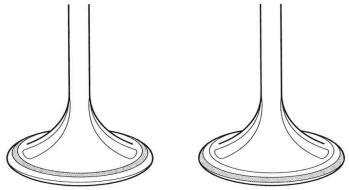
・Wipe off the red lead primer on the valve faces, and strike the valves once and lightly with the valve punner without rotating them, and check the contact surfaces for damages or scratches.





Scratch on the seat

Uneven seat width



Contacting at a low position

Contacting at a high position

Service Limit:

Need to be fixed when the service limit at IN is more than 1.5 mm and when the service limit at EX is more than 1.7 mm.

- If there is a scratch on the valve seat, modify the seat.
- If the contact width is wide, narrow, in a high or low position, modify the seat.
- Ask machine shop for modification.

Inspection of Rocker Arm:

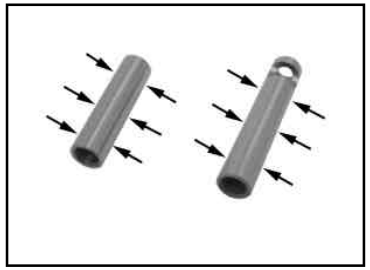
- Check the rocker arms for scratches, damages and jamming. And check if the bearing rotates smoothly.
- Measure the internal diameter of the rocker arms.
- Unfasten an adjust bolt, and check it for scratches. If it is scratched, change it with a new one.

Service limit : If the inner diameter is bigger than 10.05 mm, replace the rocker arm.

Inspection of Rocker Arm Shaft

- Check the rocker arm shaft for bending, scratches, and damages.
- Measure the external diameter of the rocker arm shaft.

∴ Service limit : If the external diameter is smaller than 9.92 mm, replace it.



Outer diameter of the rocker arm shaft subtracted from the inner diameter of rocker arm is a clearance.

∴ Service limit : If the clearance is bigger than 0.1 mm, replace the rocker arm shaft.

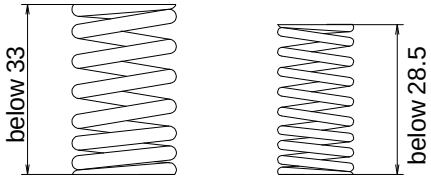
Inspection of Valve Spring Retainer

- Inspect the contact surface of valve spring and retainer or keepers.
- If they are in good condition, they may be reused.

Inspection of Valve Spring

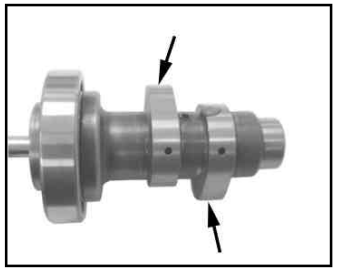
- Check the valve springs for scratches and damages.
- Measure the free length of the valve springs.

∴ Outer : If the length is below 33, replace them.
Inner : If the length is below 28.5, replace them.



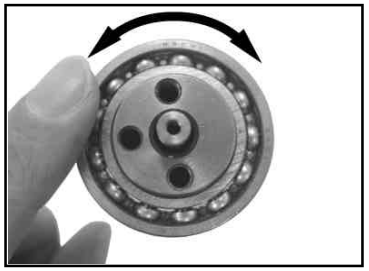
Inspection of Camshaft

- Check the camshaft for scratches, cracks, and damages.

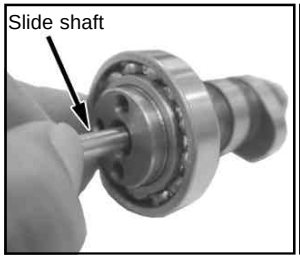


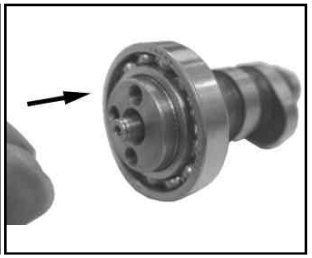
Inspection of the Camshaft Bearing

- Rotate the outer race of the bearings with fingers.
  If the outer race does not rotate smoothly or if it is rickety, replace either the ball bearing or cam shaft.

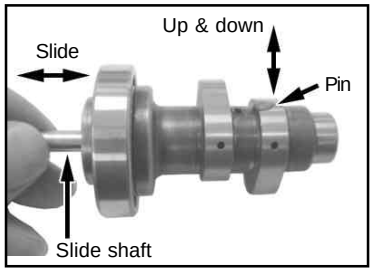


- **In the case of automatic decompression camshaft:**
  Pull the slide shaft of the camshaft center.
  And compress the spring in the shaft, and release the shaft. Then, check if the slide shaft slides smoothly and slides back to its original position.
  If the slide shaft does not slide smoothly or the tension is not on the spring of the slide shaft, change the camshaft.



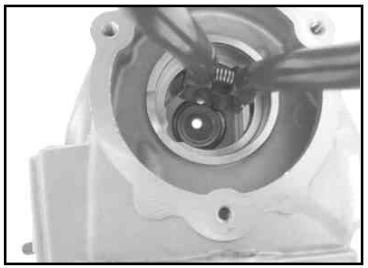


- Slide the slide shaft, and check if the decompression pin moves up and down on the EX side cam.
  If the pin does not move up and down when you slide the shaft, or the shaft does not slide because it has become stuck, then change the cam shaft.

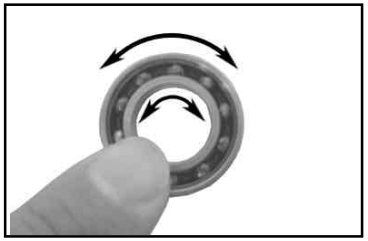


Inspection of the bearing

- Take out the C-shaped ring from the cylinder head and remove the ball bearing.

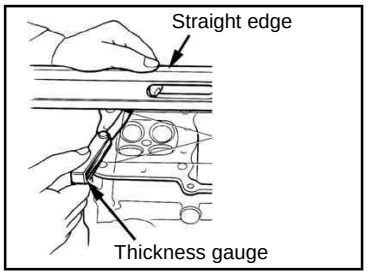


- Rotate the bearing race with fingers. If it does not rotate smoothly or if it is rickety, replace the bearing.



Inspection of Cylinder Head

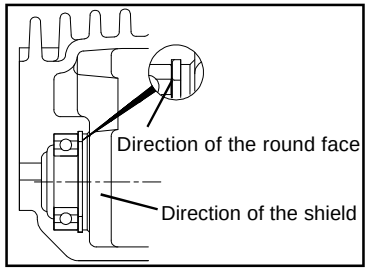
- Check the spark plug hole and valve hole for the cracks in the vicinity.
  Check the cylinder head for distortion with a straight edge and thickness gauge.



Service limit: If the distortion is over 0.05 mm, rectify or replace the cylinder head.

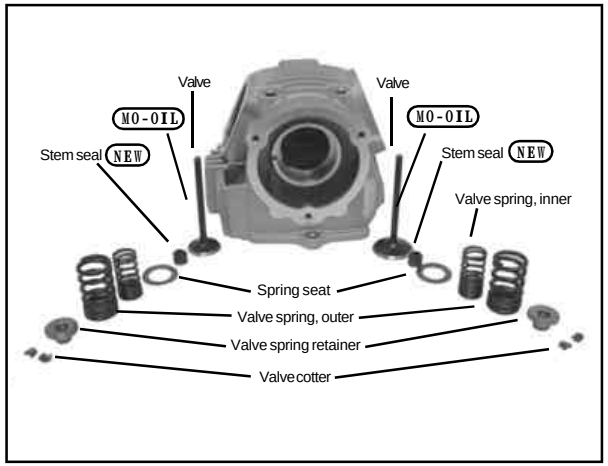
Installation of Bearing

- Install the bearing to the cylinder head with the shield facing the camshaft.
- Install the C-shaped ring with its round portion facing the bearing.



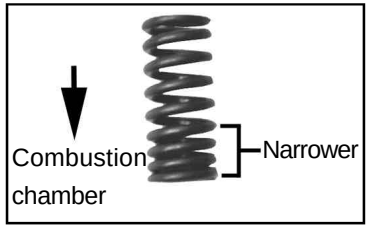
●Valve Assembly:

- Install valve spring seats and new valve stem seals.
- Apply molybdenum solution to the sliding surfaces of the valve stems, and fit the valves into the valve guides, rotating valves slowly with care not to damage the stem seals.



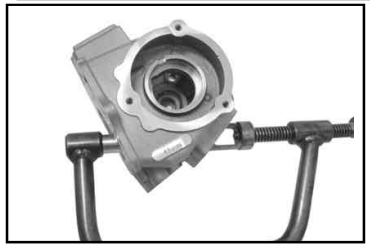
- To the head, attach the valve spring, with a narrowly-pitch side pointing to the combustion chamber.

⚠ CAUTION: Be sure to place the narrower-pitched portion of the valve spring to face the combustion chamber side.



- Compress the valve spring with a valve spring compressor. And apply a thin coat of grease to valve cotters, and install them.

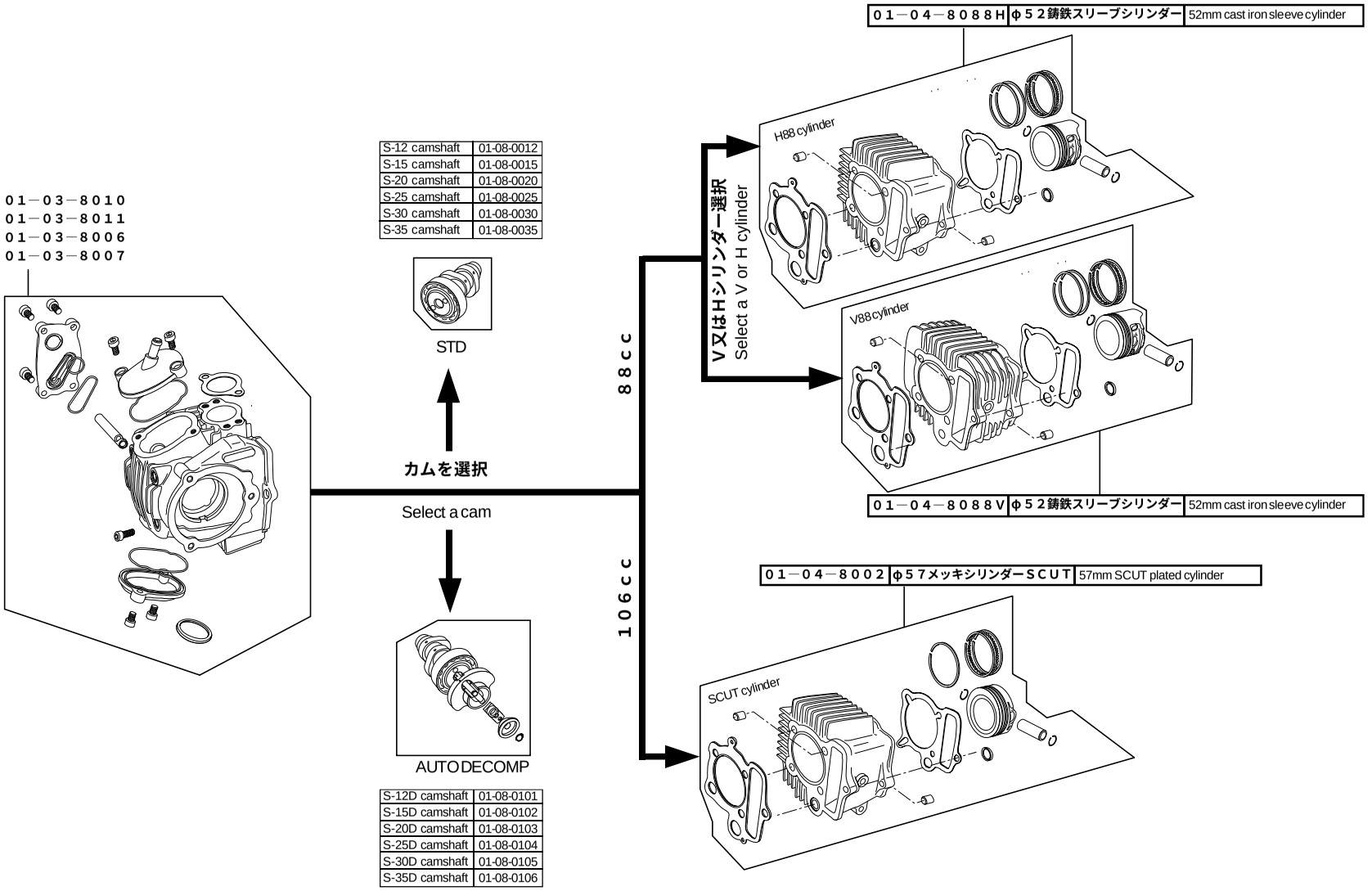
⚠ CAUTION: Do not compress the valve spring more than necessary.



- Strike lightly the end of valve stems a few times so the valves and cotters fit together well.

⚠ CAUTION: Be careful not to damage the valves.

Super head+R ボアアップ参照表（８８ｃｃ、１０６ｃｃ）
Reference data on bore- up kit (88cc,106cc)



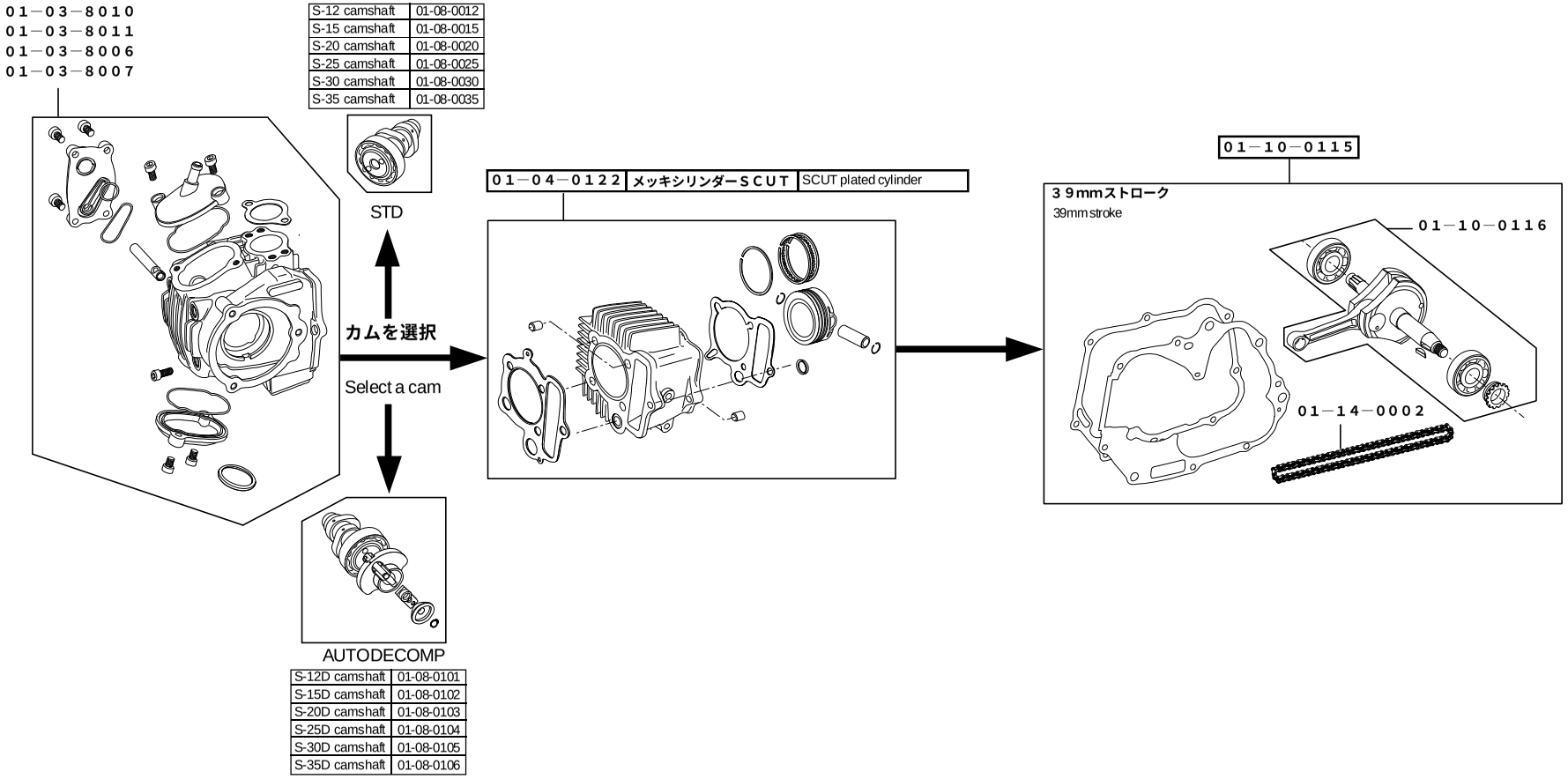
S-12 camshaft	01-08-0012
S-15 camshaft	01-08-0015
S-20 camshaft	01-08-0020
S-25 camshaft	01-08-0025
S-30 camshaft	01-08-0030
S-35 camshaft	01-08-0035

S-12D camshaft	01-08-0101
S-15D camshaft	01-08-0102
S-20D camshaft	01-08-0103
S-25D camshaft	01-08-0104
S-30D camshaft	01-08-0105
S-35D camshaft	01-08-0106

☆０１－０３－８０１０・０１－０３－８０１１・０１－０３－８００６・０１－０３－８００７シリンダーヘッドキットのみで購入された場合、この参照表にて専用パーツを検討して下さい。（ＣＤ９０除く）

If you have purchased a cylinder head kit only (Item No. 01-03-8010・01-03-8011・01-03-8006・01-03-8007), please study to install these special parts referring to this reference data. (except CD90)

Super head+R ボア＆ストローク参照表（１００ｃｃ）
Reference data on bore- & stroke kit (100cc)



☆０１－０３－８０１０・０１－０３－８０１１・０１－０３－８００６・０１－０３－８００７シリンダーヘッドキットのみで購入された場合、この参照表にて専用パーツを検討して下さい。（ＣＤ９０除く）

If you have purchased a cylinder head kit only (Item No. 01-03-8010・01-03-8011・01-03-8006・01-03-8007), please study to install these special parts referring to this reference data. (except CD90)

Super head+R ボア＆ストロークアップ参照表（１０６ｃｃ）
Reference data on bore- & stroke-up kit (106cc)

Dec./14/'10 rev.Mar./25/'11

01－03－8010
01－03－8011
01－03－8006
01－03－8007

S-12 camshaft	01-08-0012
S-15 camshaft	01-08-0015
S-20 camshaft	01-08-0020
S-25 camshaft	01-08-0025
S-30 camshaft	01-08-0030
S-35 camshaft	01-08-0035

STD

カムを選択
Select a cam

AUTO DECOMP

S-12D camshaft	01-08-0101
S-15D camshaft	01-08-0102
S-20D camshaft	01-08-0103
S-25D camshaft	01-08-0104
S-30D camshaft	01-08-0105
S-35D camshaft	01-08-0106

V又はHシリンダー選択
Select a V or H cylinder

01－04－8106H 鋳鉄スリーブシリンダー Cast iron sleeve cylinder

H106 cylinder

V106 cylinder

01－04－8106V	鋳鉄スリーブシリンダー	Cast iron sleeve cylinder		
01－04－8106VA	メッキシリンダー	Plated cylinder	クランクケース加工必要	Require crankcase modification

2B又は3Bクランク選択
Select a 2B or 3B crank

01－10－8432T

3点支持クランクシャフト－５０mmストローク（３B）
Three-point supporting crank shaft-50mm stroke (3B)

01－10－0071T

05－02－0011AL

01－14－0002

５０mmストローク（２B）
50mm stroke (2B)

01－10－0071

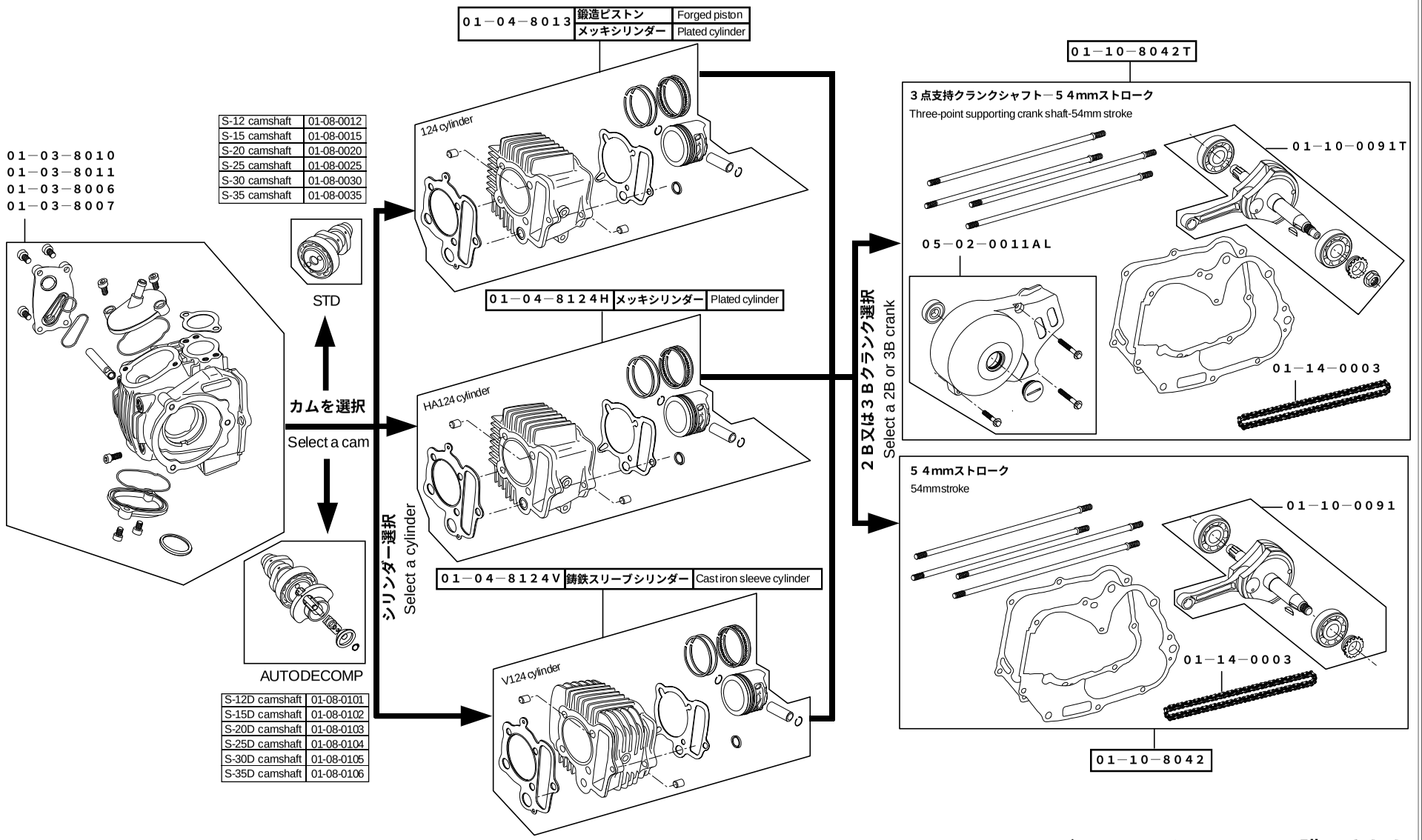
01－14－0002

01－10－8432

☆０１－０３－８０１０・０１－０３－８０１１・０１－０３－８００６・０１－０３－８００７シリンダーヘッドキットのみで購入された場合、この参照表にて専用パーツを検討して下さい。（ＣＤ９０除く）

If you have purchased a cylinder head kit only (Item No. 01-03-8010・01-03-8011・01-03-8006・01-03-8007), please study to install these special parts referring to this reference data. (except CD90)

Super head+R ボア＆ストロークアップ参照表（１２４ｃｃ）
Reference data on bore- & stroke-up kit (124cc)



☆０１－０３－８０１０・０１－０３－８０１１・０１－０３－８００６・０１－０３－８００７シリンダーヘッドキットのみで購入された場合、この参照表にて専用パーツを検討して下さい。（ＣＤ９０除く）

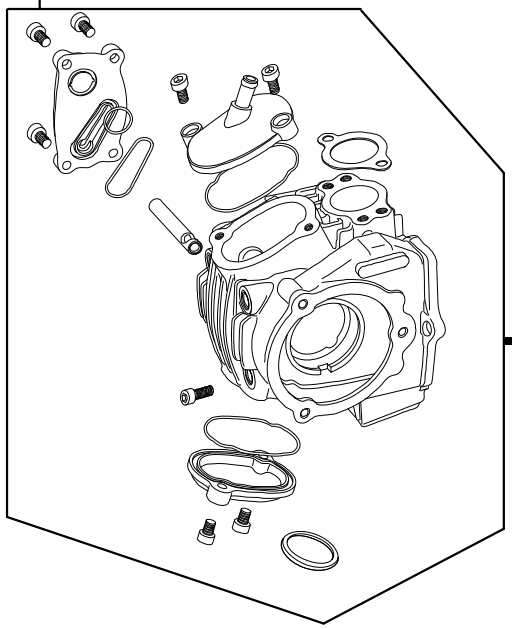
If you have purchased a cylinder head kit only (Item No. 01-03-8010・01-03-8011・01-03-8006・01-03-8007), please study to install these special parts referring to this reference data. (except CD90)

Ｃ Ｄ ９ ０ エンジン用　ボアアップ参照表
Reference data on bore- up kit For a CD90 engine

Dec./14/'10 rev.Mar./25/'11

０１－０４－０１０６Ｈ	φ５４メッキシリンダー	φ54 Plated cylinder	クランクケース加工必要	Require crankcase modification

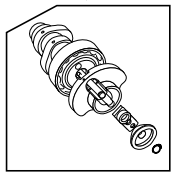
０１－０３－８０１０
０１－０３－８０１１
０１－０３－８００６
０１－０３－８００７



S-12 camshaft	01-08-0012
S-15 camshaft	01-08-0015
S-20 camshaft	01-08-0020
S-25 camshaft	01-08-0025
S-30 camshaft	01-08-0030
S-35 camshaft	01-08-0035

STD

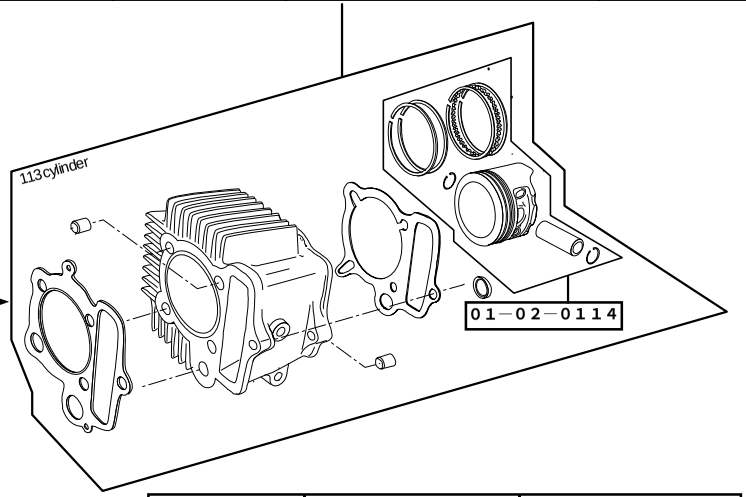
カムを選択
Select a cam



AUTO DECOMP

S-12D camshaft	01-08-0101
S-15D camshaft	01-08-0102
S-20D camshaft	01-08-0103
S-25D camshaft	01-08-0104
S-30D camshaft	01-08-0105
S-35D camshaft	01-08-0106

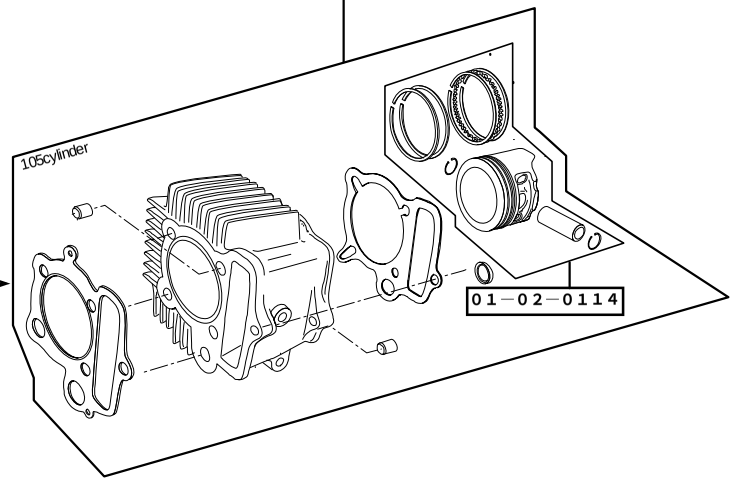
１１３ｃｃ



シリンダー選択
Select a cylinder

１０５ｃｃ

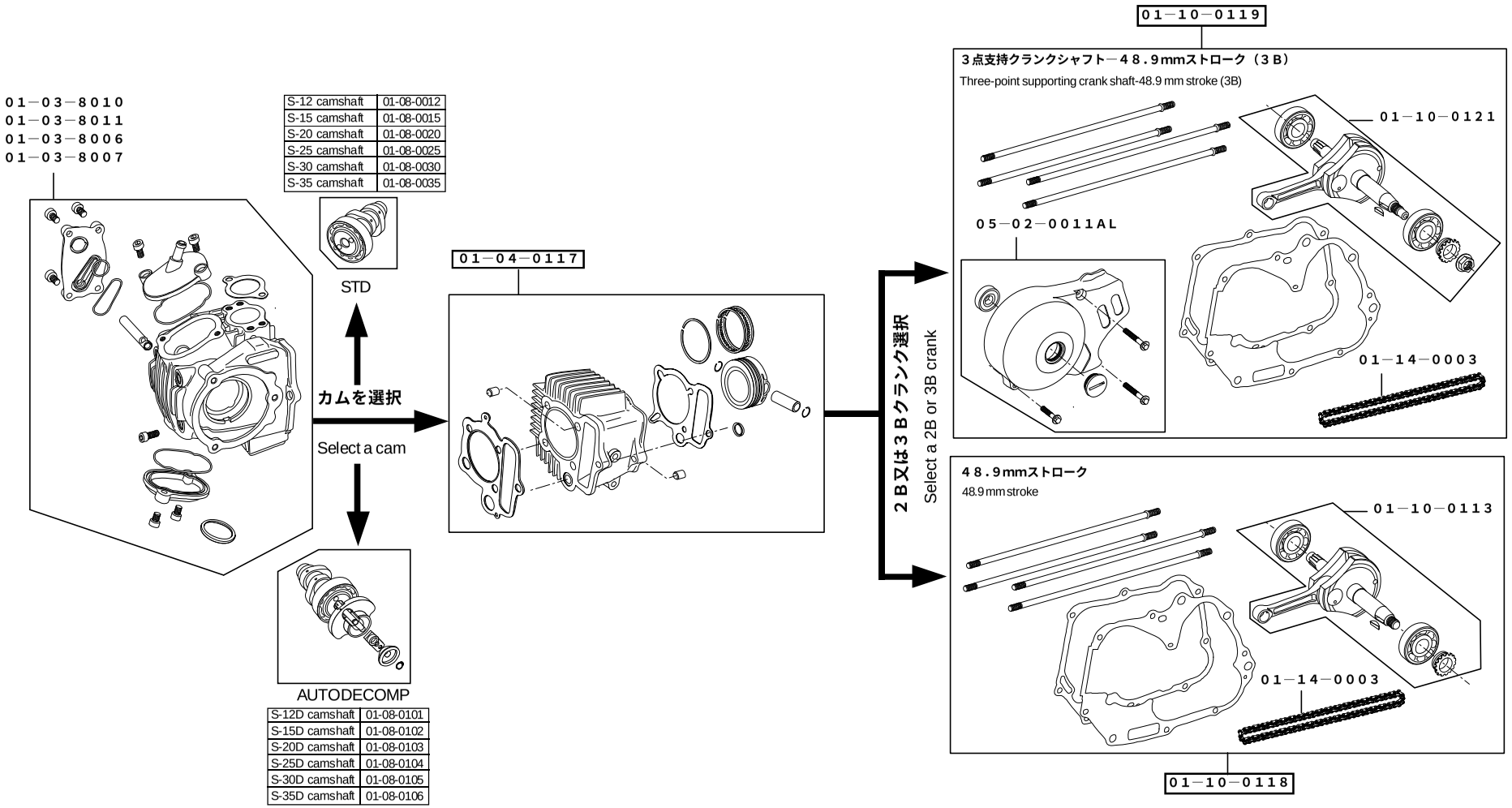
０１－０４－０１２５	φ５２鋳鉄スリーブシリンダー	52mm cast iron sleeve cylinder	



☆０１－０３－８０１０・０１－０３－８０１１・０１－０３－８００６・０１－０３－８００７シリンダーヘッドキットのみで購入された場合、この参照表にて専用パーツを検討して下さい。（ＣＤ９０除く）

If you have purchased a cylinder head kit only (Item No. 01-03-8010・01-03-8011・01-03-8006・01-03-8007), please study to install these special parts referring to this reference data. (except CD90)

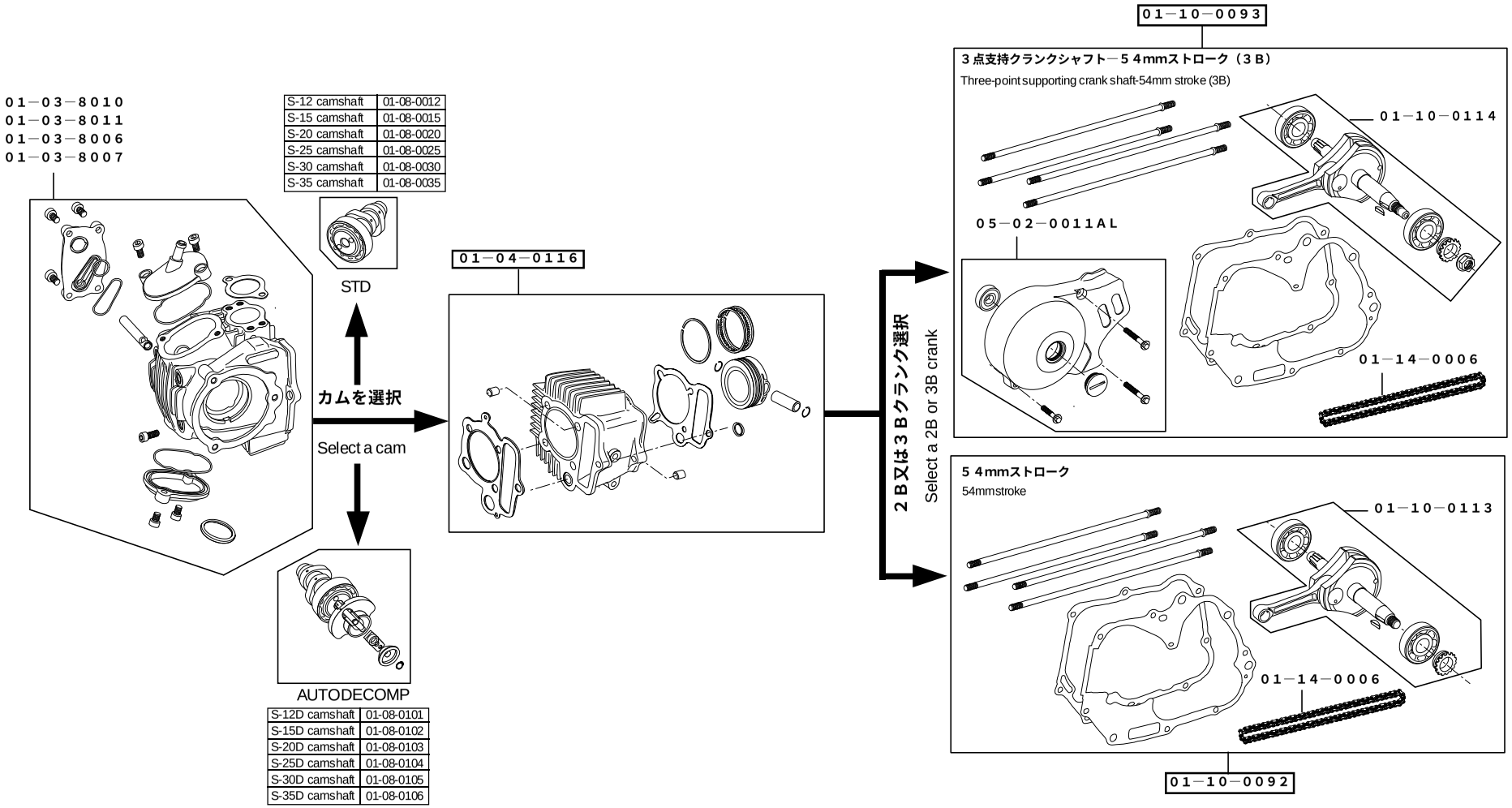
Super head+R ボア＆ストロークアップ参照表（１２５ｃｃ）
Reference data on bore- & stroke-up kit (125cc)



☆０１－０３－８０１０・０１－０３－８０１１・０１－０３－８００６・０１－０３－８００７シリンダーヘッドキットのみで購入された場合、この参照表にて専用パーツを検討して下さい。（ＣＤ９０除く）

If you have purchased a cylinder head kit only (Item No. 01-03-8010・01-03-8011・01-03-8006・01-03-8007), please study to install these special parts referring to this reference data. (except CD90)

Super head+R ボア＆ストロークアップ参照表（１３８ｃｃ）
Reference data on bore- & stroke-up kit (138cc)



☆０１－０３－８０１０・０１－０３－８０１１・０１－０３－８００６・０１－０３－８００７シリンダーヘッドキットのみで購入された場合、この参照表にて専用パーツを検討して下さい。（ＣＤ９０除く）

If you have purchased a cylinder head kit only (Item No. 01-03-8010・01-03-8011・01-03-8006・01-03-8007), please study to install these special parts referring to this reference data. (except CD90)